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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,438

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Ernest Grimberg

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67801

7590

03/17/2010

MARTIN D. MOYNIHAN d/b/a PRTSI, INC.

P.O. BOX 16446

ARLINGTON, VA 22215

EXAMINER

GREEN, YARA B

ART UNIT

PAPER NUMBER

2884

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,438	<b>Applicant(s)</b> GRIMBERG, ERNEST	
	<b>Examiner</b> YARA B. GREEN	<b>Art Unit</b> 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 62-72 and 74-81 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 62-72 and 74-81 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/12/2010</u> . | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. This Office Action is in response to Applicant's Amendment January 12, 2010. No claims have been amended, added, or canceled. Currently, claims 62-72 and 74-81 are pending.

#### ***Response to Amendment***

2. The Declaration filed on December 22, 2009 under 37 CFR 1.131 has been considered and effectively overcomes the August 5, 2003 reference.

#### ***Information Disclosure Statement***

3. The information disclosure statement (IDS) submitted on January 12, 2010 was filed after the mailing date of the Non-Final Rejection on November 4, 2009. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 62-64, 66-67, and 71-72** are rejected under 35 U.S.C. 102(b) as being anticipated by Butler (US 2002/0074499; published June 20, 2002).

Re **claim 62**, Butler discloses an infrared imaging camera comprising (para. 0005, 0010):  
an uncooled and unshielded detector comprising an array of infrared sensor arranged to detect infrared radiated energy (para. 0028, 0031),

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a non-uniformity corrector, associated with said detector, operable to perform non-uniformity correction on output of said arrays to provide uniform outputs having a uniform response to energy detected at said uncooled sensor (para. 0028-0029);

a calibrator to carry out periodic calibration operations by taking at least one calibration temperature measurement over said camera and to derive from said at least one calibration temperature measurement a reference temperature indicative of radiation energy not from an external scene (para. 0026, 0037, 0057), such that the reference temperature and the detector response to radiated energy impinging on said detector allow a temperature of objects in said camera's field of view to be calculated using a same signal to temperature function for each of said outputs to obtain a temperature, wherein said reference temperature is a parameter of said function (para. 0057, 0068, 0026-0027).

Re **claim 63**, Butler discloses wherein the infrared imaging camera is configured to combine a value from an initial calibration measurement with a second value taken from a second calibration measurement, said combining using a time-dependent function to produce extrapolations of said corrections for later points in time after said calibration temperature measurements (para. 0060-0063).

Re **claim 64**, Butler discloses wherein said time-dependent function comprises a mathematical extrapolation function from most recent calibration temperature measurements (para. 0060-0063).

Re **claim 66**, Butler discloses wherein the infrared imaging camera is configured to make said correction using an initial value which is a function of a temperature measurement of a housing of said camera (para. 0026-0027, 0035).

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Re **claims 67** and **72**, Butler discloses wherein the calibration measurements are made at intervals less than the thermal time constant of the camera (para. 0055, 0056). It follows that repeated measurements during the changing temperature of the camera falls within the thermal time constant of the camera.

Re **claim 71**, Butler discloses wherein the uncooled detector comprises a microbolometer array (para. 0028) where it follows that bolometers used in thermal cameras may include microbolometers

6. **Claims 65, 68, 69, and 74-80** are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler (US 2002/0074499; published June 20, 2002) in view of Tsuchimoto et al. (EP 0837600; published April 22, 1998).

Re **claims 65** and **68**, Butler discloses the limitations of claim 62, as mentioned above, but do not teach making a correction using a temperature of the shutter of the camera. Butler does teach, however, aiming the infrared camera at a blackbody whose temperature is known in order to correct for non-uniformities amongst the detector elements (para. 0096) but is silent with regards to origin of the blackbody. Butler also teaches employing a shutter (para. 0104). In a similar field of endeavour, Tsuchimoto et al. disclose measuring the radiation of the camera's closed shutter whose temperature is known by virtue of an attached thermistor in order to correct for non-uniformities amongst the detector elements. The radiation emitted from the shutter is treated as blackbody radiation (page 6, lines 36-48; page 4, line 58 - page 5, line 4). One of ordinary skill in the art would have been motivated to implement the shutter temperature as the calibration source of Butler as taught by Tsuchimoto et al. in order to provide an easy and quick method for calibration without having to include a separate mechanism for inserting a reference blackbody source.

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Furthermore, Butler teaches wherein a sensor is located external to the surface of the vacuum packaging and a sensor is located on a case surrounding the optics of the camera (para. 0027). Butler is silent with regards to the type of sensor used for temperature measurement, thereby allowing for that which is well known in the art. Tsuchimoto et al. teach thermistors to be suitable sensors for measuring the temperature of a desired area of an infrared camera. Therefore, it would have been obvious to one of ordinary skill in the art to implement thermistors as the sensors of Butler, as taught by Tsuchimoto et al., as they have been demonstrated to be acceptable temperature detectors.

Re **claim 69**, Butler, as modified by Tsuchimoto et al., teaches the limitations of claim 65 as mentioned above. The blackbody of Butler inherently requires the emissivity to be substantially approaching one (see discussion of claim 65 above).

Re **claims 74 and 75**, Butler discloses a temperature correction apparatus, for correcting a response of a radiometer in accordance with a local camera temperature, said radiometer comprising:  
an unshielded uncooled infrared (IR) detector comprising an array of IR sensors (para. 0028, 0031)

for providing an image response in order to form a temperature image in accordance with IR radiation impinging on said IR sensor's field of view (FOV) (para. 0026-0028);

a non-uniformity corrector, associated with said detector, operable to perform non-uniformity correction on output of said array to provide uniform outputs having a uniform response to energy detected at said uncooled sensor (para. 0028-0029).

Butler does teach aiming the infrared camera at a blackbody whose temperature is known in order to correct for non-uniformities amongst the detector elements (para. 0096) but is silent with regards to origin of the blackbody. Butler also teaches employing a shutter (para. 0104). In a similar

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field of endeavour, Tsuchimoto et al. disclose measuring the radiation of the camera's closed shutter whose temperature is known by virtue of an attached thermistor in order to correct for non-uniformities amongst the detector elements. The radiation emitted from the shutter is treated as blackbody radiation (page 6, lines 36-48; page 4, line 58 - page 5, line 4). One of ordinary skill in the art would have been motivated to implement the shutter temperature as the calibration source of Butler as taught by Tsuchimoto et al. in order to provide an easy and quick method for calibration without having to include a separate mechanism for inserting a reference blackbody source.

Butler further teach where such calibration involve a reference for deriving a reference temperature indicative of radiated energy not from an external scene and for approximating a temporal drift of local temperature and correcting the signal representative of the temperature of objects in the radiometer's field of view (para. 0057-0063).

Re **claim 76**, Butler, as modified by Tsuchimoto et al., teach the limitations of claim 74, as mentioned above. Butler further teaches wherein said approximation is a mathematical functional approximation based on previous measured data (para. 0060-0063).

Re **claim 77**, Butler, as modified by Tsuchimoto et al., teach the limitations of claim 74, as mentioned above. Butler further discloses wherein the IR sensor array is operable to provide a two-dimensional image (para. 0039-0040).

Re claim **78**, Butler, as modified by Tsuchimoto et al., teach the limitations of claim 74, as mentioned above. Butler further disclose wherein the IR sensor comprises an array of microbolometers (para. 0028) where it follows that bolometers used in thermal cameras may include microbolometers, and wherein said signal corrector is operable to calculate a difference between a bolometer level and a reference level comprising an average video signal of the IR sensor, and to use said difference to produce said correction (para. 0066, 0106).

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Re claims **79** and **80** the limitations disclosed essentially recite the limitations of claims 74, 75, and 76, and therefore are rejected similarly.

7. **Claim 70** is rejected under 35 U.S.C. 103(a) as being unpatentable over Butler (US 2002/0074499; published June 20, 2002) in view of Tsuchimoto et al. (EP 0837600; published April 22, 1998) and further in view of Everest (US Patent No. 4,907,895; published March 13, 1990).

Butler, as modified by Tsuchimoto et al., teach the limitations of claim 65, as mentioned above, but do not teach the shutter to be reflective. In a similar field of endeavour, Everest teaches coating at least part of the internal side of a shutter so that it highly reflective (i.e. has a reflectivity substantially approaching 1) to the infrared radiation generated by the sensor. This allows for the shutter to act as a mirror to the sensor so that it may be able to detect radiation resulting from the detector and not from the field of view (col. 3, lines 13-18; col. 4, lines 52-67; col. 5, lines 10-15). It would have been obvious to one of ordinary skill in the art for the shutter to comprise a material that may reflect radiation indicative of the uncooled detector, as taught by Everest, in the apparatus of Butler, as modified by Tsuchimoto et al., in order to eliminate erroneous signals due to heating of the detector.

8. **Claims 81** is rejected under 35 U.S.C. 103(a) as being unpatentable over Butler (US 2002/0074499; published June 20, 2002) in view of Tsuchimoto et al. (EP 0837600; published April 22, 1998) in view of Frey (US Patent No. 5,925,875; published July 20, 1999).

Butler, as modified by Tsuchimoto et al., teach the limitations of claim 79, as mentioned above but are silent with regards to filtering the image signal in order to compensate for modulated transfer function effects. In a similar field of endeavour, Frey teaches using a high pass filter in



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conjunction with a focal plane array in order to remove the unwanted temporal noise and fixed pattern noise components of an image signal (i.e. MTF effects) (col. 5, lines 50-61; col. 6, lines 45-65). One of ordinary skill in the art would have been motivated to implement the filtering of Frey in the method of Butler, as modified by Tsuchimoto et al., in order to remove noise components of an image.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to YARA B. GREEN whose telephone number is (571)270-3035. The examiner can normally be reached on Monday - Thursday, 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Porta/  
Supervisory Patent Examiner, Art Unit

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Yara B. Green  
/YBG/